SONY

PAL


# Sony Digital Camcorder

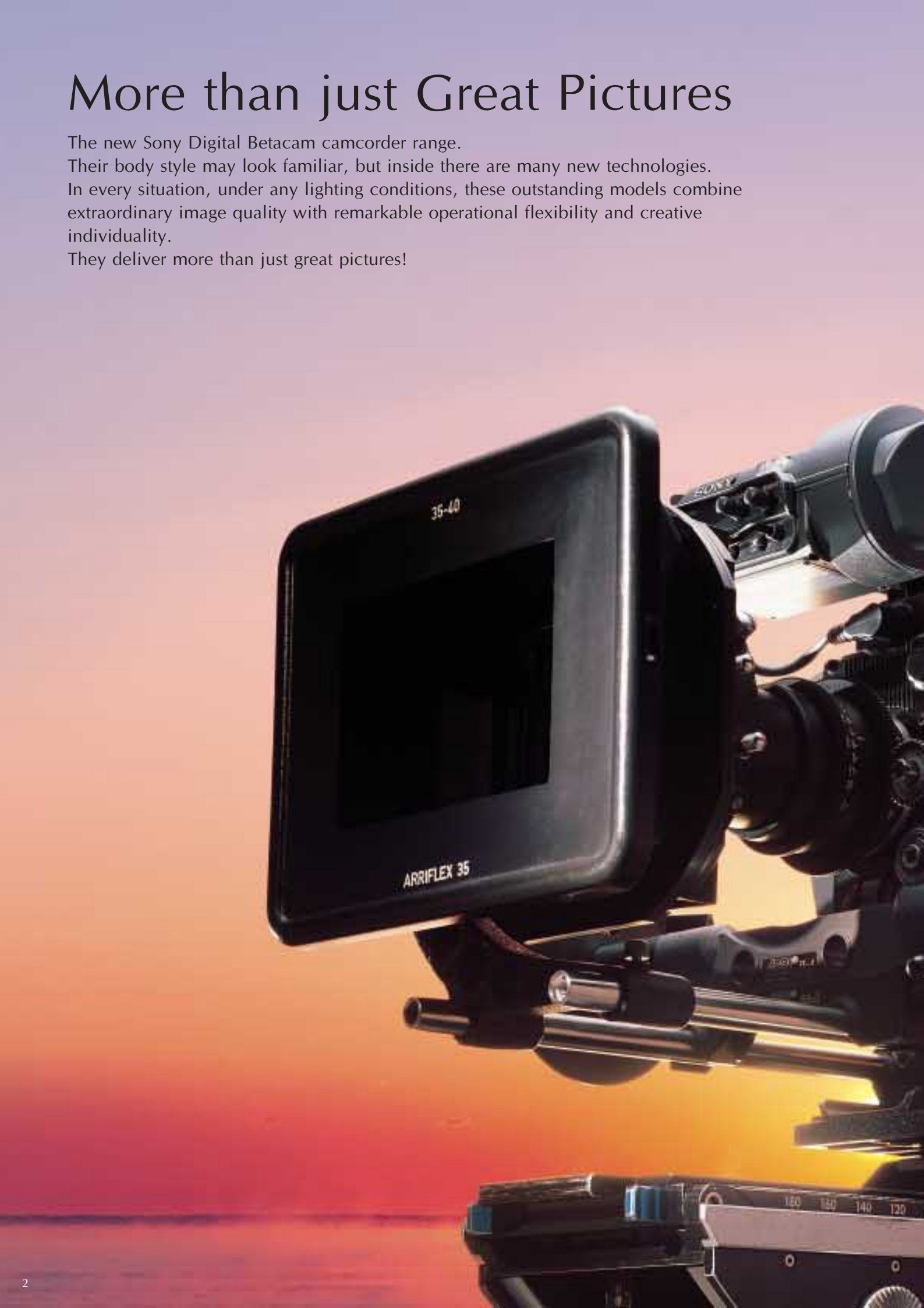
**DVW-790WSP**

**DVW-709WSP**

**DVW-707P**

# More than just Great Pictures

The new Sony Digital Betacam camcorder range.
Their body style may look familiar, but inside there are many new technologies.
In every situation, under any lighting conditions, these outstanding models combine extraordinary image quality with remarkable operational flexibility and creative individuality.
They deliver more than just great pictures!

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# ‘In-Camera’ Creativity

A camera is a creative tool and it should allow its user to work smoothly and confidently, with no distractions or worries.
When designing a camera, the vital first step is to determine the tasks it will undertake. Then the optimum arrangement that will enable an operator to fulfil these tasks can be decided. This synergy is vital because the combination of camera design and operator's skills has a powerful influence on the final look of a production.
With these objectives in mind, and building on the digital heritage and unrivalled imaging know-how of Sony, we started the design of the new Digital Betacam camcorders.

The result is the second generation of Digital Betacam camcorders – created with the sole purpose of producing perfect pictures. From the very first camera shot in a production, the operator now has the power to make unique creative contributions during shooting. Using these models, so much more can now be done ‘In-Camera’ that is in defiance of conventional wisdom. The new Digital Betacam camcorders deliver outstanding "in-camera" creativity!


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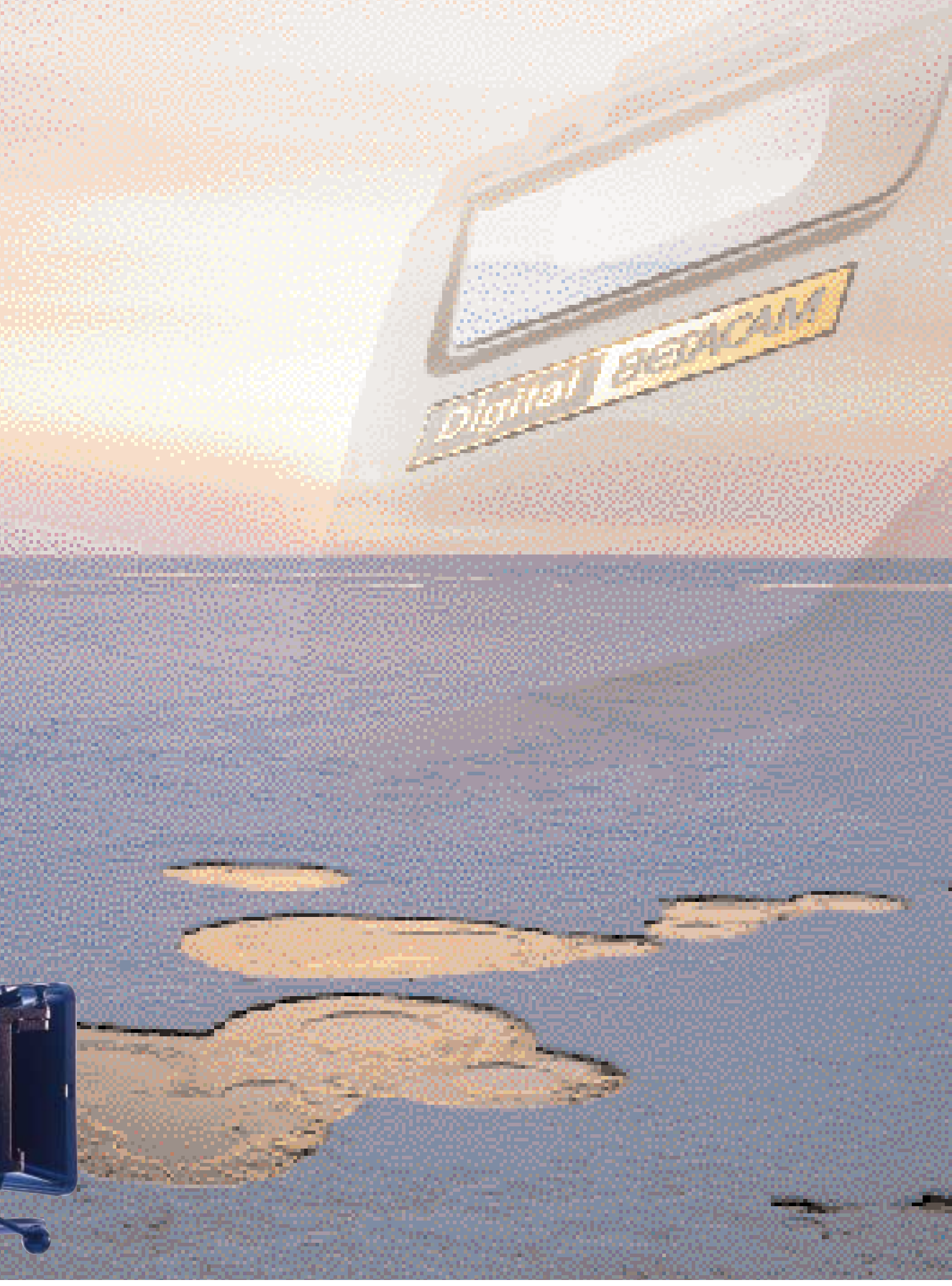
# The Format that Means Quality And Extra Peace of Mind!

Digital Betacam uses 10-bit component digital recording to provide superb picture quality and multi-generation capability. Conforming to the ITU-R BT 601 standard adopted for the D-1 format, it records a 4:2:2 digital component video signal together with four channels of 20-bit/48 kHz digital audio.

Bit Rate Reduction (BRR) technology has made it possible to provide very efficient handling of video signals. Digital Betacam uses very mild intrafield data compression of about 2:1. Applying data compression within each field avoids aliasing, ensuring outstanding multi-generation performance.

Because of its robustness, reliability and high-end performance, Digital Betacam has been accepted as the industry standard for the production and postproduction of demanding and sophisticated programmes. A large number of postproduction houses world-wide offer Digital Betacam based editing. Digital Betacam has also become the dominant digital format for programme interchange, with a large majority of broadcasters using it as their preferred transmission format. Many industry awards for innovation and technology had been awarded to Sony for the Digital Betacam. Digital Betacam is the format that means quality and offers extra piece of mind to production teams and broadcasting organisations.

**1994-1995**
**Emmy Award for Digital Betacam**


Digital Learncam

# A wide range of models for a wide range of productions

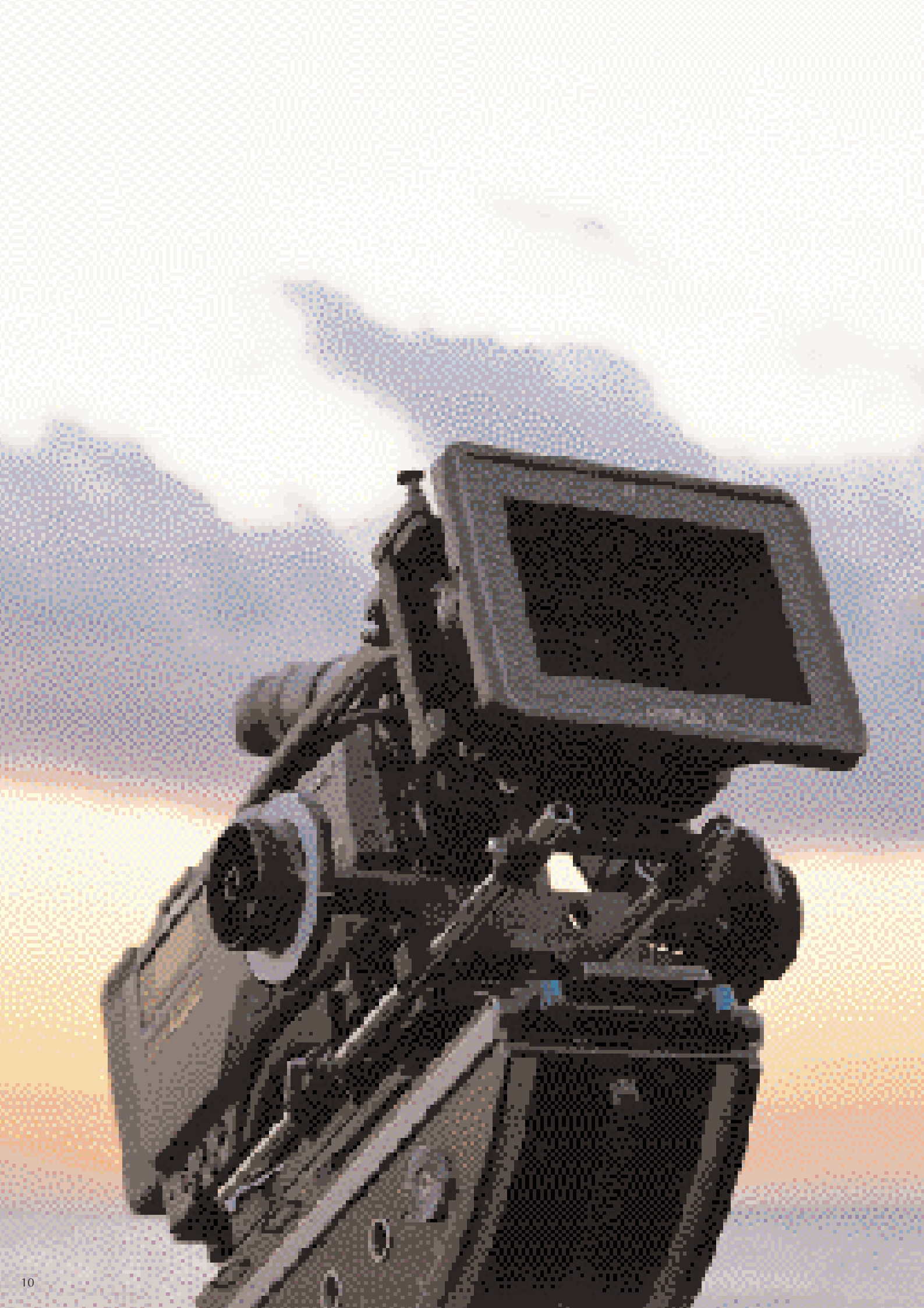
Over the years, working closely with world-leading cinematographers and programme producers, Sony has been developing the Digital Cinematography concept. During this time, an ever increasing number of high-end commercials, dramas and documentaries has been shot with the widely admired and trusted DVW-700WSP Camcorder. Many users' ideas, suggestions and recommendations have now been incorporated in three new models.

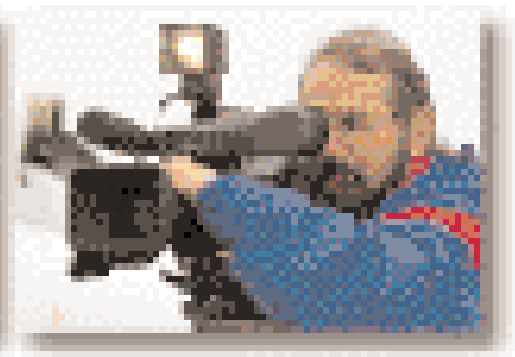
The DVW-790WSP is the direct successor of the DVW-700WSP, and the perfect tool for demanding Digital Cinematography applications.
It incorporates 2/3-inch (620K) Power HAD FIT CCDs with a 16:9/4:3 switchable aspect ratio.

The DVW-709WSP, as the lower price 16:9 model, is ideal for cost-effective Digital Betacam widescreen shooting. It is based on 2/3-inch (620K) Power HAD IT CCDs with a 16:9/4:3 switchable aspect ratio.

The DVW-707P, the entry level 4:3 model, provides the opportunity to enjoy the advantages of the Digital Betacam format at a low cost. It employs 2/3-inch (470K) Power HAD IT CCDs with a 4:3 aspect ratio.

This wide range of models is perfectly suitable for a wide range of productions.





In any situation, under any conditions
we wish to help you produce perfect pictures.


SONY

# New Technologies for New Creativity

## Power HAD™ Technology

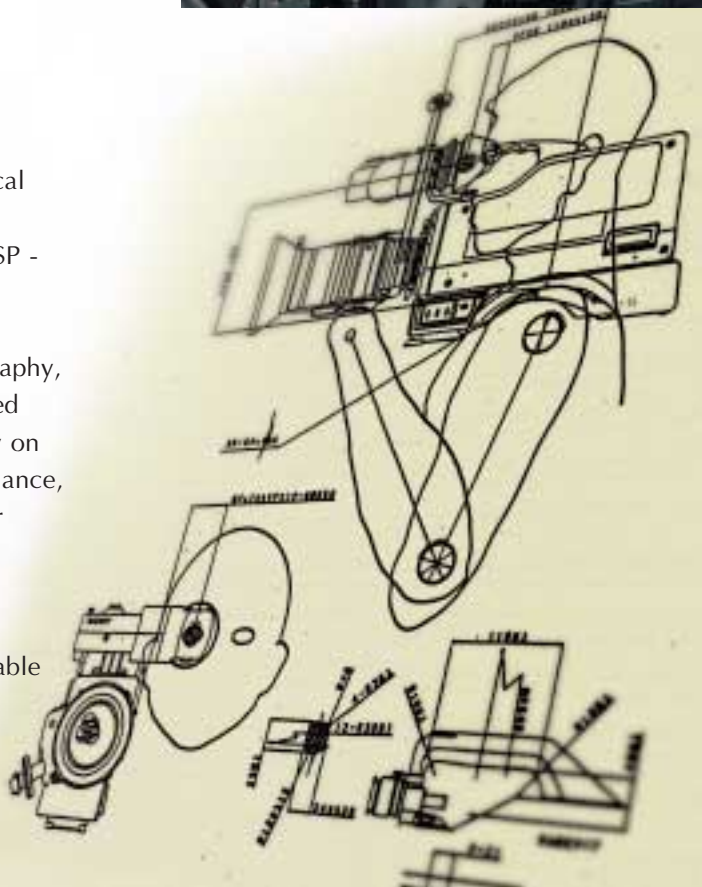
All new models employ Power HAD CCDs. Building on the Hyper HAD™ system, with its On-Chip-Lens layer that brought major improvement to camera performance, further technological improvements have been incorporated to implement Power HAD technology. Power HAD sensors further reduce vertical smear, allowing total freedom of picture content. They also bring higher sensitivity to enable shooting in low light conditions and contribute significantly to outstanding signal to noise ratio performance. The Power HADsensors of the DVW-707P provide a sensitivity of F10.0 at 2000 lux (equivalent to 600 ISO or more) while the DVW-709WSP and DVW-790WSP have a sensitivity of F9.0 at 2000 lux (equivalent to 500 ISO or more).

## Advanced Digital Signal Processing

The new and very sophisticated 12-bit Advanced Digital Signal Processing (ADSP) of the new Digital Betacam camcorders ensures not only superb picture quality with a wide dynamic range (600%) and enhanced tonal reproduction, but also offers attractive operational features when setting camera parameters. These camcorders have the familiar, but vastly improved, menu-driven setup that allows a very high level of user customisation.
This function is further enhanced with the use of the ever-popular BSC-1 'Smart' Setup Cards that include an IC-based memory. These cards store preferred settings for a camcorder, making it possible to recreate a desired 'look' instantly and effortlessly.

## Design

From the outside, all three models look identical and have a very similar appearance to their predecessors the DVW-700P and DVW-700WSP - although with some subtle but important refinements. Operate these camcorders in any working style, from ENG to Digital Cinematography, and the very stylish and ergonomically designed body is quickly appreciated. It sits comfortably on the shoulder, thanks to its excellent weight balance, and can be very firmly fitted on a gear-head or tripod for more elaborate shots. Its low optical axis is also helpful.
The operating weight, including a viewfinder, battery, cassette, microphone and typical portable lens, is only 7 kg (7 lb 7 oz).



## Cassette Loading

Vertical cassette loading minimises the risk of anything unwanted getting into the tape mechanism. The robust cassette compartment is dust and drip proof, and minimises acoustic noise from the rotating head drum.

## Stereo Audio Line Output

A stereo audio line output is available from the 5-pin XLR connector on the rear of the camcorder. This provides two analogue audio output channels, which can be selected to be either CH-1/2 or CH-3/4.

## Internal Light System

All new Digital Betacam camcorder models incorporate an internal light system. An Anton Bauer standard 2-pin socket can supply up to 50 W from the camcorder's lithium-ion battery. The light can be switched on and off manually or, in Auto mode, is switched on when recording starts and off when recording stops to maximise battery life. A switch on the side of the camcorders selects Manual or Auto mode.

*Anton/Bauer products may not be available in some countries.

## Optical Filter Wheels

Two independent optical filter wheels, one with Neutral Density (ND) filters and one with Colour Correction (CC) filters, are installed in both of the widescreen models. An optional servo filter drive unit, the BKDW-701 can also be fitted.
The DVW-707P has only one filter wheel, with a combination of ND and CC filters.

## Electronic Shutter

Like the DVW-700P and DVW-700WSP camcorders, all three new models have an electronic shutter with the following speeds: 1/60, 1/125, 1/250, 1/500, 1/1000 and 1/2000 of a second. This helps in capturing clear images of fast-moving objects with minimum motion blur. Thanks to the high sensitivity of these camcorders, even the fastest speeds can be used without the amount of available light being a major concern.

## Turbo Gain – High Sensitivity

The nominal sensitivity of all models is high, but in some situations it is necessary to shoot in extremely low light conditions. The Turbo Gain feature raises the gain level to an incredible +48 dB. Thanks to this feature, it is possible to record critical scenes down to around 0.2 lux – somewhat exceeding the colour sight capability of the human eye.

## LCD Status Panel and Diagnostic System

All the main operational switches are in their familiar place on the side of the camera. The LCD panel is on the same side, showing a wide range of status and diagnostic displays. The VTR set-up menu is now displayed in the viewfinder.

## Clear Scan

The Clear Scan function is available to minimise the horizontal bars that can appear when shooting computer CRT displays. The DVW-790WSP FIT Camcorder additionally provides Extended Clear Scan which allows electronic shutter speeds to be set below 50 Hz.

## Super EVS

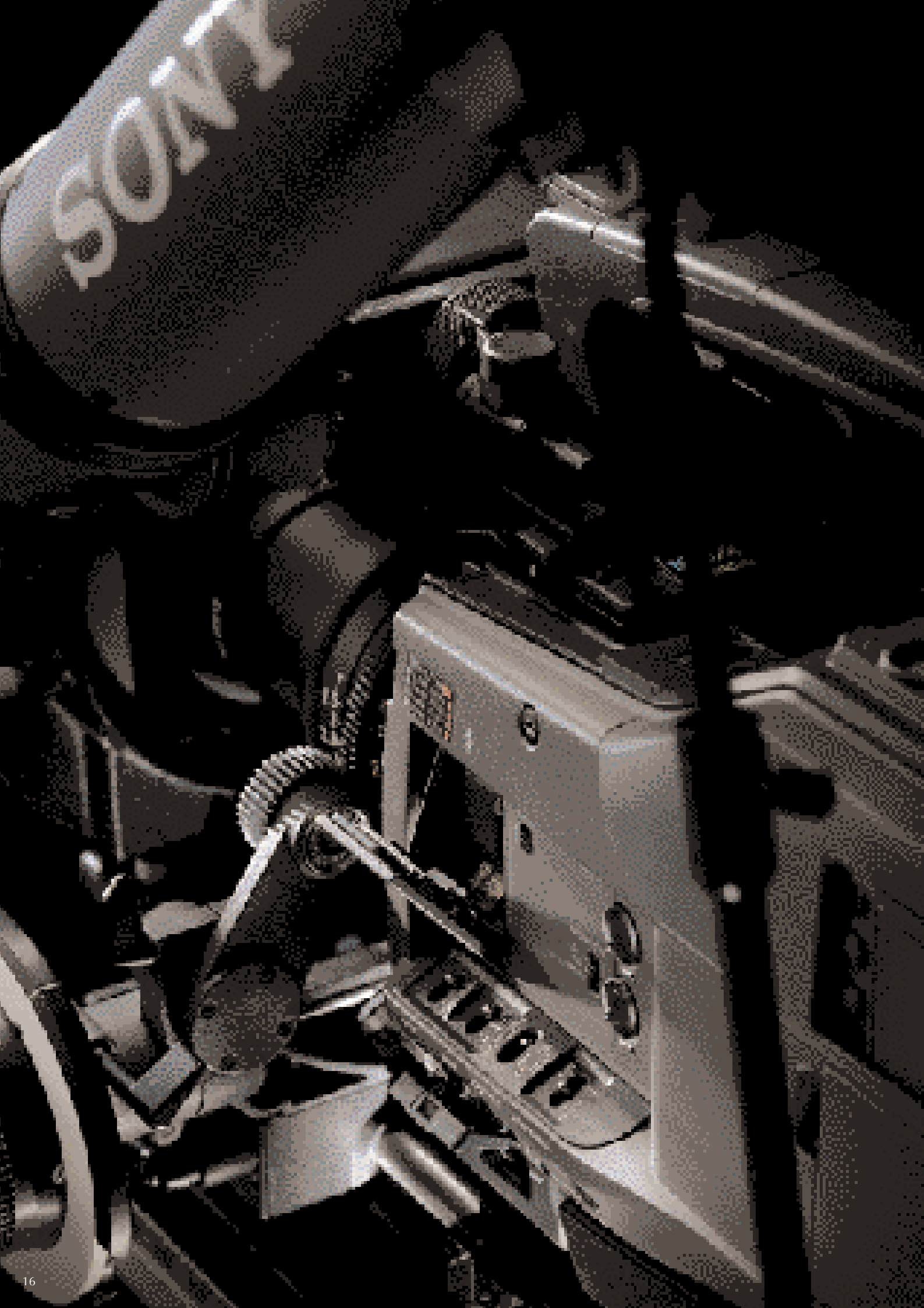
Super Enhanced Vertical Definition (EVS) mode is available and increases the vertical resolution of the shot. Frame mode also increases the vertical resolution but is only suitable for shooting still pictures.

## Shot Data Recording

All models have the capability to record many types of relevant information such as the date and time of shooting, shot ID, cassette number and shot number, identifying them for the later stages of production and post production.

## Assignable (assigning function) Button

You can assign ATW, RET, REC, Turbo Gain and other functions to this switch.


SOAP

# Creative Features for Creative Expressions

BSC-1

Menu-driven setup has been a unique and powerful feature of the DVW-700P and DVW-700WSP models for many years. Because of this feature, setting up Digital Betacam camcorders became a creative process instead of a tedious and laborious engineering necessity. This way, camera operators were given a unique opportunity to customise their camera settings, so that they precisely suited production requirements. Combined with the ability to store data on a 'smart' Setup Card, this brought a tremendous increase in the operational capability of these camcorders. Now, building on this feature, these new models arrive with even more user-friendly menus and simpler ways of changing parameter values. In particular, there are five totally new pages which can be customised, called 'Camera Operator Menus'. These allow any single item from any other page to be added to make up your own favourite menu system, which can then be stored on a Setup Card. There are also several new and exciting operational capabilities, the most important of which are now described in relation to the most significant picture parameters.

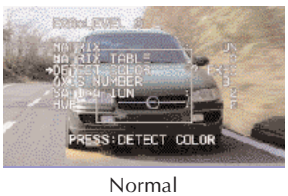

Rotary Menu Switch

## Colourimetry

The DVW-790WSP, DVW-709WSP and DVW-707P models produce pictures with astonishing colour reproduction accuracy, yet offer possibilities for creative intervention.

### Multi Matrix

This function allows a particular colour to be automatically grabbed, and its hue and saturation altered within a range of approximately 20 degrees. This permits the very interesting 'in camera' effects normally reserved for postproduction special effects work.



Normal


After

## Colour Balance

Colour balance is widely regarded as one of the essential settings for any shoot. There are a number of alternative ways of setting this when shooting with Digital Betacam camcorders. By using Auto White (and Black) balance, an accurate overall colour balance can be obtained. Alternatively, using the remotely controllable paint functions, colour levels can be adjusted according to the operator's needs. For this operation, either the new RM-B150 or the existing RM-P9 Remote Control Units can be used. When the desired colour balance has been achieved, the remote control unit can be unplugged without disturbing the settings.


RM-B150

### Auto Tracing White Balance

The DVW-790WSP, DVW-709WSP and DVW-707P all include Auto Tracing White (ATW) balance. This allows automatic tracing of the white balance in situations where the overall colourimetry of the lighting changes. This is a particularly useful feature for continuous shooting that requires the subject to be followed from exterior to interior, i.e. from daylight to tungsten lighting, but with no opportunity to colour balance the camera.


AWB/ABB switch

### Colour Temperature Control

It is now possible to dial in the required colour temperature of the camera. In addition, the overall colour balance of the picture can be changed to make it 'warmer' or 'colder'. This feature can be used very creatively, particularly in scenes with mixed colour lighting.


Normal


Warmer


Colder

# Contrast Range

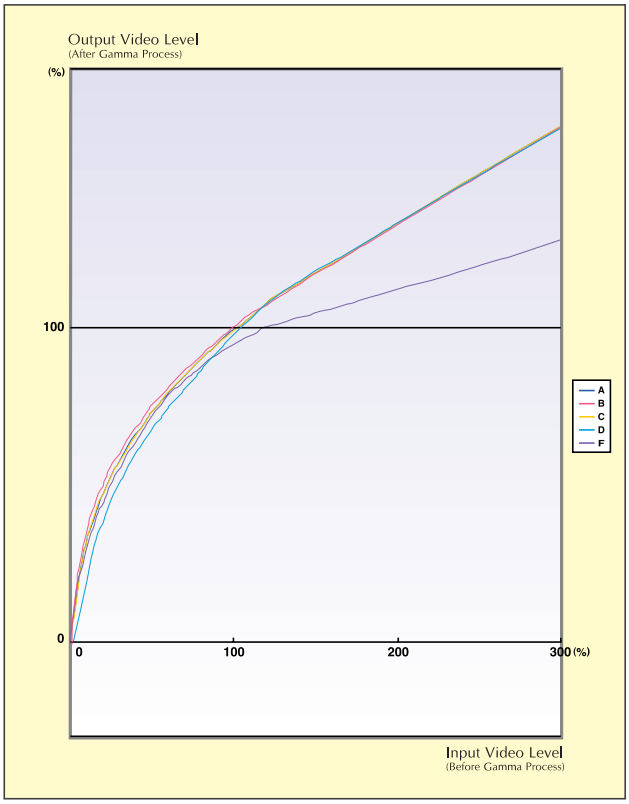
The new DVW-790WSP, DVW-709WSP and DVW-707P can handle a very impressive contrast range. A number of useful features are readily available to help production crews meet specific shooting requirements.

## Gamma

The gamma curve, in general, determines the way in which mid-tones are handled and therefore is of vital importance in achieving the overall 'look' of a shot. Changing master gamma is achieved either from a remote control unit or via the setup menu. These new camcorders are provided with a more natural and smoother gamma curve with 48 gamma points (the previous generation of DVW-700P and DVW-700WSP models had 32 gamma points) and therefore a more natural overall tonal reproduction.

In addition to master gamma and gamma balance, several independent gamma curves are provided to increase operational flexibility. They can all be accessed via the setup menu. Curve A is the standard setting. Curve B gives a higher initial gamma gain, stretching black areas of the picture. Gamma C further increases the initial gamma. Gamma F is the so-called 'Film Gamma' and represents the average transfer characteristics of a few of the most popular film stocks. It has a shallow slope in the shadows area, slopes uniformly in the mid-tone region and flattens off in the high-lights, enhancing the overall dynamic range.

All the above gamma curves are built-in and cannot be altered. However, the Gamma S position is reserved for a gamma curve that can be read from the Digital Gamma Setup Cards (BSC-1 Pack) or from a PC running Sony BZP-100 setup software. This software allows this gamma curve to be modified.





Normal

Gamma A

Gamma F

## Black Gamma

The Black Gamma function helps to control shadows area with precision. It can help to bring out details from the dark parts of the picture without affecting mid-tones and keeping absolute black level unchanged. The range of creative possibilities offered by the flexibility of setting up Gamma and Black Gamma is quite inspiring and, when mastered, offers users a great advantage in achieving a desired 'look'.

## Highlight Handling

Thanks to Power HAD technology and 12-bit Advanced Digital Signal Processing, Digital Betacam camcorders cover a very wide dynamic range of up to 600%. Dynamic range is often defined as the capability of a camera to capture a very large difference between the brightest and darkest parts of a scene, and is very dependent on the knee circuits.

A well-known problem with handling highlights is their effect on skin tones. To overcome this problem, and improve overall picture quality, the new Digital Betacam camcorder range incorporates TruEye™ processing. Exactly like the human eye, this processes the dynamic range of the camera before gamma correction by using brightness, hue and saturation instead of individual red, green and blue signal processing. Knee correction is therefore effectively processed only on the brightness (luminance) signal content. As far as saturation is concerned, the video level of each of the red, green and blue channels can be compressed without causing hue rotation, although the saturation slowly decreases as the signal level

approaches clipping. The correct hue is maintained, and an image can naturally converge into white at the clip point.

Because the net result is faithful colour reproduction above the knee point, the knee point can be lowered from the conventional value of 98% to 85%, and also the knee slope is much larger. This gives a much wider visible dynamic range.

## How TruEye Processing Functions

To understand the knee circuits used in the new camcorder, it is necessary to understand TruEye processing.

TruEye processing is one of the most innovative features that DSP allows, and makes it possible to reproduce a far more natural colour than a conventional analogue camera, even in severe shooting conditions. A knee circuit is necessary to compress the very wide dynamic range of the CCD sensor (600%) to the much more limited recording standard (109%). The knee circuit functions to compress the video output level when it exceeds a certain video input level, called the knee point. Thus, the dynamic range of the camera can be broadened, and images in bright areas that exceed the standard video level can be seen.

In cameras with conventional processing, this knee correction is performed individually in the red, green and blue channels. Since the knee correction is a non-linear process, and is located after gamma correction, the balance of hue, saturation and brightness are changed after processing. The point at which the knee circuit of each colour operates will depend entirely on the picture composition and colour balance. Therefore, one colour may be in the non-linear part of the transfer curve (above the knee point) while another is still quite linear (below the knee point). In this case, the hue is rotated in bright parts of the picture, and faithful colour reproduction is impossible. This is why human skin tends to look yellow when parts of the picture are even slightly overexposed. Remember that this is a normal situation where some areas in the picture tend to be more reflective than others – a shiny forehead is a typical example. The overall exposure will be correct.

## Knee Saturation

Knee saturation acts together with TruEye to maintain the saturation in those picture areas compressed by the knee function. Normally, any highlight which is above the knee threshold will reduce the saturation until the final clip point, when that picture area will be perfectly white.

Advanced TruEye

RGB Knee Compensation

Conventional TruEye

## Definition – Picture Sharpness

The new Digital Betacam models reproduce pictures with natural sharpness and plenty of fine details. Furthermore, the combination of the new 12-bit ADSP, together with many new and innovative detail functions, allows very precise control of the way the picture texture and edges are represented. This is an important factor when using postproduction techniques such as multi-layering and chroma keying. Gone are the days of the extreme video look, with harsh thick black edges and ultra fine detail totally lost and aliased. These camcorders treat every image as if spun from pure silk.

### Soft Focus

This new feature allows the picture to be softened in a similar manner as if using optical filters. The Soft Focus control is particularly convenient for those who found conventional video images to be too sharp. This fine adjustment allows the creation of more cinematic or film-like pictures.

Normal

Soft Focus

### Adaptive Detail

The Adaptive Detail control, also known as Knee Aperture, ensures that the detail enhancement in the highlight areas looks natural. By automatically reducing the amplitude of the detail enhancement signal in the highlight area, the detail aliasing in these areas is completely eliminated.

### Skin Tone Detail Correction

Skin Tone Detail Correction controls the detail level of objects that have specific colour tones. It is particularly useful when shooting actors and actresses with minor skin blemishes. With this function, only selected areas of the picture are affected, with the remainder of the scene maintaining its full crispness. Furthermore, within selected areas, details can be enhanced as well as softened.

## Picture Stability

Digital Betacam camcorders deliver rock steady pictures. There is none of the picture weave usually associated with material originated on film.
The picture stability is particularly relevant for productions incorporating multi-layering special effects. Also, the emergence of highly compressed delivery systems, including DVD and digital transmission using multiple GOPs, calls for a high level of picture stability to maintain picture quality – even when highly compressed within an MPEG-based environment.

## Texture

Because of their very good signal to noise ratio performance, the DVW-790WSP, DVW-709WSP and DVW-707P deliver grain-free pictures with the finest, most delicate and almost transparent texture. This is particularly useful when working on productions that require multi-layering and blue-screen effects. The separation between useful information and unwanted grain or noise is straightforward and delivers accurate and spectacular results.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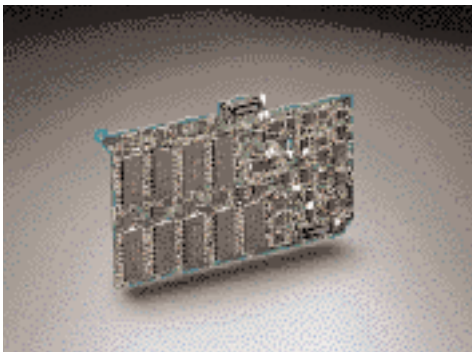
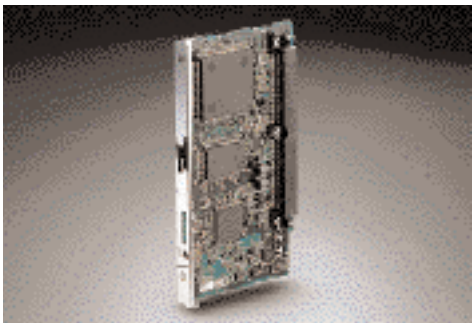
# Operational Accessories

A full range of operational accessories is available to take full advantage of the versatility and operational features of these new camcorders.



## Picture Cache Board (Optional)

A new and extremely attractive feature is now available for all three new Digital Betacam camcorder models. This is the BKDW-703 Picture Cache Board option which, when installed, provides up to eight seconds of loop recording using solid state memory. Thus, when the REC start button is pressed, everything that happened up to eight seconds before that moment is recorded on tape. Just imagine - if something happens in front of your camera, you will still have up to eight seconds to decide whether or not you want it recorded on tape. You have the choice of recording for 1, 2, 4 or 8 seconds.



## SDI Output Board (Optional)

To increase the operational convenience of all Digital Betacam camcorders, the new optional BKDW-702 SDI Output Board is available. When installed into any of the three models it provides an SDI output signal, as defined by ITU-R BT601, from the rear Video Output connector. This way production crew on location can see the picture at its best.


## Digital Cinematography Accessories (Optional)

Recognising the acceptance of Sony Digital Betacam camcorders for Digital Cinematography productions, many film-related manufacturers are now offering film-type accessories for DVW models. These include special digital cinematography zoom and prime lenses, base plates, matte boxes, follow focus units, etc. This is particularly relevant for crews principally used to working with film. A range of special lenses optimised for Digital Cinematography style production is available from most manufacturers. These are mainly calibrated in T stops rather than F stops, have more turns to the focus ring, have Arri gear teeth for follow focus kits and a reduced zoom range. There is also a range of prime lenses for 2/3-inch mount cameras.


## Extended Viewfinder (Order-based)

The new Sony extended viewfinder, the BKW-LVF1, is of particular interest to crews used to film-style shooting. It facilitates operation of Digital Betacam camcorder when shooting in the same style as with a film camera.

## Colour Viewfinder (Optional)

The BVF-VC10W Colour Viewfinder offers accurate colourimetry in a perfect viewing environment – even in bright sunlight. Seeing colour images helps picture composition and framing. It also gives good impression of the overall colour balance.

# Digital Cinematography style of shoot

Any of the three new Digital Betacam camcorders will undoubtedly produce some of the finest and most accurate pictures even when using their factory settings. To achieve a more cinematic or film-like look, special attention has to be paid to the camera setting and to the use of appropriate operational accessories and lenses. The flexibility of these camcorders, together with cinematic-style shooting, lighting and grading techniques will provide very gratifying results.

With the Digital Cinematography, the high production value is ensured through exceptional picture quality and versatile treatments. The high production security is achieved through immediacy & instant review of the material on location. The increased production speed is facilitated thanks to the direct entry to digital postproduction. And all that at the decreased production cost mainly due to improved production efficiency and lower cost of row stock. The Digital Cinematography has widely been accepted as a very economic, high quality alternative for programme production. Shooting on Digital Betacam tape also means more control in post-production.  There are no costs for processing and telecine transfer. Different camera

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settings can be saved on memory cards for different kinds of takes and be recalled in seconds. And the creative possibilities regarding the handling of parameters such as colourimetry, detail correction, skin-tone detail correction, gamma and highlight control etc, allow the camera performance to be optimised for each particular type of take.

Sony's Digital Cinematography fully meets varied production needs. The technology has evolved far enough to offer a versatile and efficient production system even for the most demanding programmes.

Digital Cinematography

# The Assurance of Sony

This is the start of a great relationship.

With every new Digital Betacam, you get far more than just a camera.

At Sony we aim to serve you promptly and professionally,

and we hope to become a valuable partner to your business.

We give you access to a range of services and benefits designed

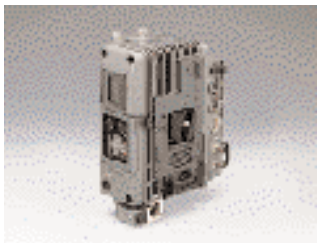
to make ownership as enjoyable, affordable and trouble-free as possible.

And if you ever need assistance, we put our existing worldwide network

of over 400 service outlets at your disposal.

You know you can rest assured with Sony.

# Optional Accessories



Sony CA-701,
Camcorder Adapter

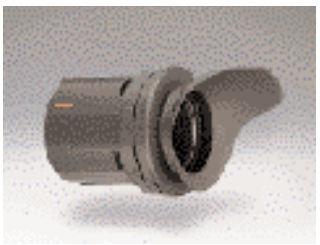
Sony CA-702P,
Camcorder Adapter

Sony CA-755P,
Camcorder Adapter

Sony BVF-V10CE,
1.5-inch B/W Viewfinder

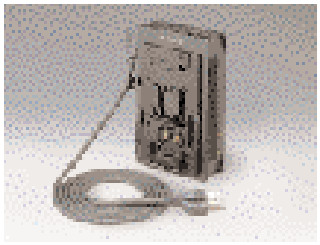
Sony BVF-V20WCE,
2-inch Widescreen B/W Viewfinder

Sony Viewfinder Eye-piece,
A-8314-798-A
(High performance, x3)

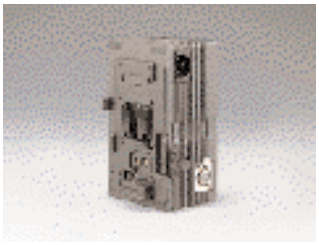


Sony Viewfinder Eye-piece
A-8262-537-A(High magnification)
A-8262-538-A(Low magnification)
A-8267-737-A(Standard magnification with special compensation for aberrations)

Sony BSC-1 Pack,
Setup Card



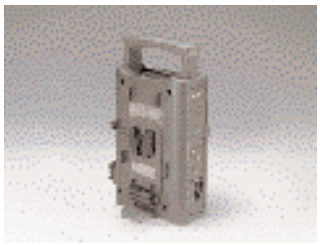
Sony AC-DN1,
AC Adapter



Sony AC-DN2A,
AC Adapter

Sony BP-L60A/L90A,
Lithium-ion Battery

Sony BC-L100CE,
Battery Charger



Sony BC-L50CE,
Battery Charger

Sony WRR-855A,
Wireless Microphone Receiver
(Adapter required)

Sony BKDW-701,
Servo Filter Unit

Sony BKW-401,
Viewfinder Rotation Bracket

Sony VCT-14,
Tripod Adapter

Sony CCU-550AP,
Camera Control Unit
(For CA-755P)

Sony BVF-55CE,
5-inch B/W Viewfinder
(For CA-701/702P/755P)

Sony BVM-9045D,
Colour Video Monitor
(With optional DC-L10)

Canon EJ6,
Prime lens

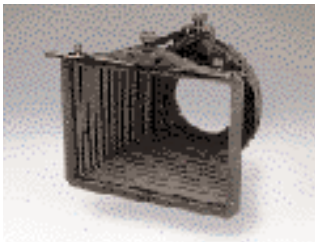
Canon EJ10,
Prime lens

Canon EJ15,
Prime lens

Canon EJ24,
Prime lens

Canon EJ35,
Prime lens

Canon J9a x 5.2B KLL-SC,
Digital Cinematography zoom lens



Canon Europe N.V. MB-300,
Matte Box for J9ax5.2B KLL-SC

Fujinon A10 x 4.8B-10,
Digital Cinematography zoom lens

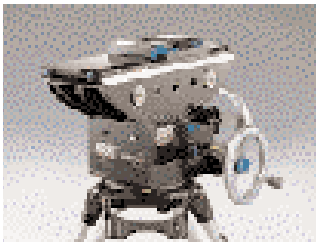
Angenieux 5.3 - 61 mm HR,
Digital Cinematography zoom lens

OpTex/Canon 8-160 mm EC Zoom Lens
(Digital Cinematography zoom lens)

Angenieux 12 x 5.3 AIF HR,
ENG zoom lens

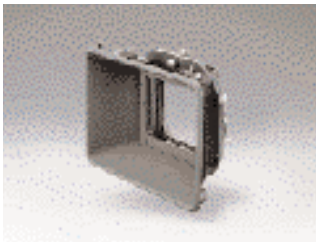
Fujinon A19 x 8.7 RM,
ENG zoom lens

Canon J21a x 7.8B IRS,
ENG zoom lens



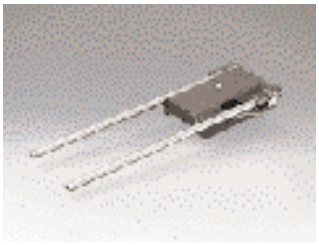
ARRI Geared head

ARRI SAP-1,
Sony Adapter Plate

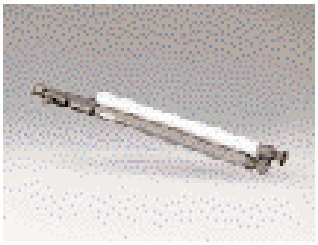


ARRI MB-17,
4" Matte Box (set)

ARRI FF-4,
Follow Focus (set)



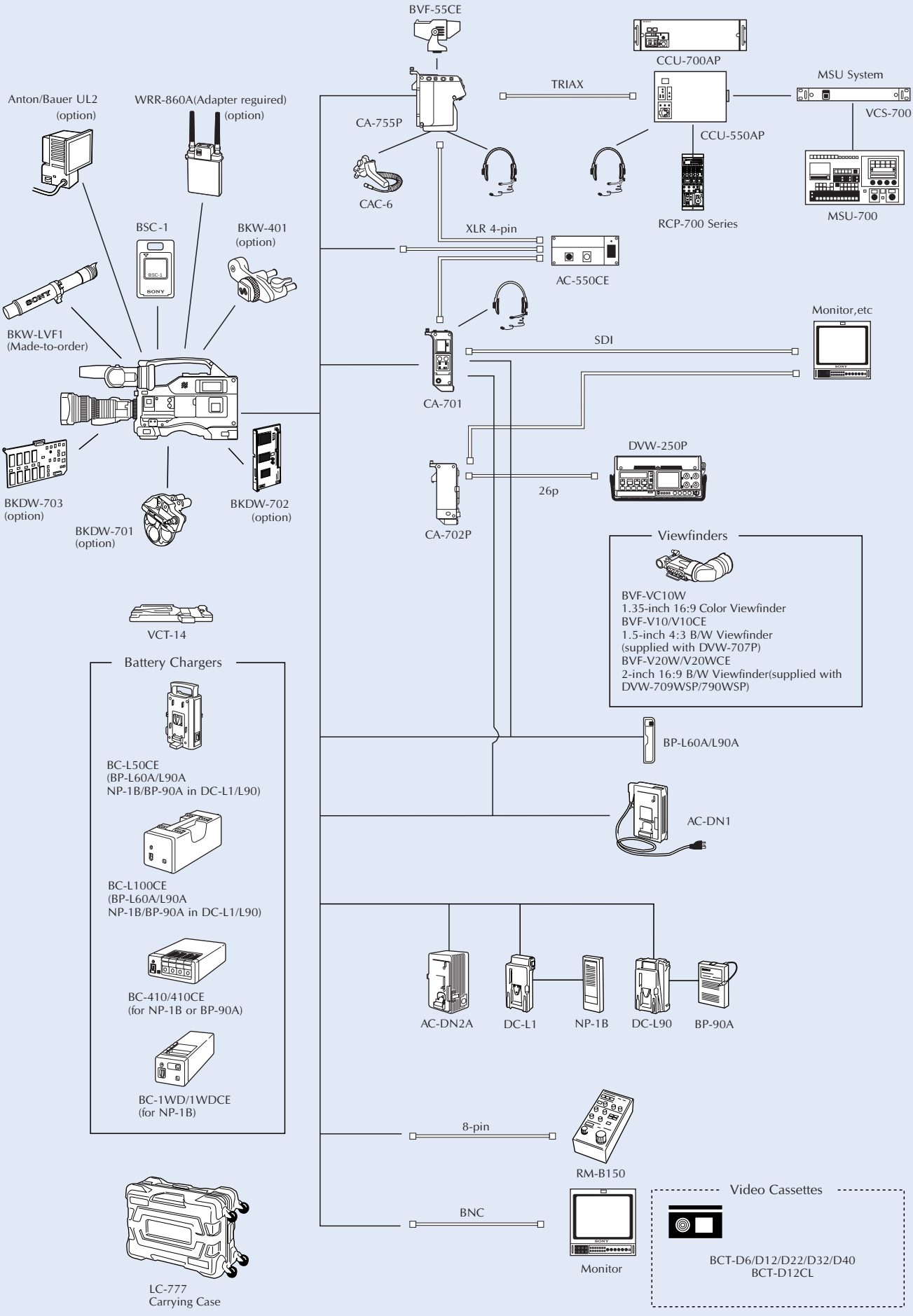
ARRI BP-6,
Bridge Plate
(with 15mm bars)



ARRI EL-3,
Eyepiece Leveller
(to support BKW-LVF1)

*A certain model may not available in some countries. For the details, please contact each manufacturer.

# System Configuration



# Specifications

| Model Name | DVW-707P | DVW-709WSP | | DVW-790WSP | |
|---|---|---|---|---|---|
| | | 16:9 MODE | 4:3 MODE | 16:9 MODE | 4:3 MODE |
| **General** | | | | | |
| **Mass** | Approx. 5 kg (11 lb. 1 oz) | Approx. 5 kg (11 lb. 1 oz) | | Approx. 5 kg (11 lb. 1 oz) | |
| Operating weight | Approx. 7 kg (15 lb. 7 oz) | Approx. 7 kg (15 lb. 7 oz) | | Approx. 7 kg (15 lb. 7 oz) | |
| Power requirements | DC 12 V +5.0 V / -1.0 V | DC 12 V +5.0 V / -1.0 V | | DC 12 V +5.0 V / -1.0 V | |
| Power consumption | 29 W | 31.5 W | | 32 W | |
| Operatingtemperature | 0 °C to +40 °C (+32 °F to +104 °F) | 0 °C to +40 °C (+32 °F to +104 °F) | | 0 °C to +40 °C (+32 °F to +104 °F) | |
| Storage temperature | -20 °C to +60 °C (-4 °F to + 140 °F) | -20 °C to +60 °C (-4 °F to + 140 °F) | | -20 °C to +60 °C (-4 °F to + 140 °F) | |
| Humidity | 25 % to 85 % (relative humidity) | 25 % to 85 % (relative humidity) | | 25 % to 85 % (relative humidity) | |
| Continuous operating time | Approx.135 min.(With BP-L60A) Approx.205 min.(With BP-L90A) | Approx.125 min.(With BP-L60A) Approx.190 min.(With BP-L90A) | | Approx.120 min.(With BP-L60A) Approx.185 min.(With BP-L90A) | |
| **Signal inputs** | | | | | |
| Genlock video | BNC type (x1), 1.0 Vp-p, 75 Ω | BNC type (x1), 1.0 Vp-p, 75 Ω | | BNC type (x1), 1.0 Vp-p, 75 Ω | |
| Time code input | BNC type (x1), 0.5 to 18 Vp-p, 10 kΩ | BNC type (x1), 0.5 to 18 Vp-p, 10 kΩ | | BNC type (x1), 0.5 to 18 Vp-p, 10 kΩ | |
| Audio (CH-1/2) | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | |
| Mic input | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | | XLR-3-31 type (x2), -60 dBm / +4 dBm selectable, high impedance, balanced | |
| **Signal outputs** | | | | | |
| Video output | BNC type (x1), 1.0 Vp-p, 75 Ω | BNC type (x1), 1.0 Vp-p, 75 Ω | | BNC type (x1), 1.0 Vp-p, 75 Ω | |
| Video test output | BNC type (x1), 1.0 Vp-p, 75 Ω | BNC type (x1), 1.0 Vp-p, 75 Ω | | BNC type (x1), 1.0 Vp-p, 75 Ω | |
| Time code output | BNC type (x1), 1.0 Vp-p, 75 Ω | BNC type (x1), 1.0 Vp-p, 75 Ω | | BNC type (x1), 1.0 Vp-p, 75 Ω | |
| Earphone | Minijack | Minijack | | Minijack | |
| Audio output(CH-1/2) | XLR-5-pin male (stereo) | XLR-5-pin male (stereo) | | XLR-5-pin male (stereo) | |
| **Others** | | | | | |
| Lens | 12-pin | 12-pin | | 12-pin | |
| Remote | 8-pin | 8-pin | | 8-pin | |
| Light | 2-pin, DC 12 V, max. 50 W | 2-pin, DC 12 V, max. 50 W | | 2-pin, DC 12 V, max. 50 W | |
| DC input | XLR-4-pin (for the optional AC-550CE) | XLR-4-pin (for the optional AC-550CE) | | XLR-4-pin (for the optional AC-550CE) | |
| DC output | 4-pin (for wireless microphone receiver), DC 12 V | 4-pin (for wireless microphone receiver), DC 12 V | | 4-pin (for wireless microphone receiver), DC 12 V | |
| Camcorder adapter | 40-pin | 40-pin | | 40-pin | |
| **VTR section** | | | | | |
| **General** | | | | | |
| Recording format | Digital Betacam | Digital Betacam | | Digital Betacam | |
| Tape speed | 96.7 mm/s | 96.7 mm/s | | 96.7 mm/s | |
| Playback/Recording time | Max. 40 min. with BCT-D40 cassette | Max. 40 min. with BCT-D40 cassette | | Max. 40 min. with BCT-D40 cassette | |
| Fast forward time | Less than 6 min. with BCT-D40 cassette | Less than 6 min. with BCT-D40 cassette | | Less than 6 min. with BCT-D40 cassette | |
| Rewind time | Less than 5 min. with BCT-D40 cassette | Less than 5 min. with BCT-D40 cassette | | Less than 5 min. with BCT-D40 cassette | |
| Recommended tape | Sony Digital Betacam S cassette, BCT-D6/D12/D22/D32/D40 Series | Sony Digital Betacam S cassette, BCT-D6/D12/D22/D32/D40 Series | | Sony Digital Betacam S cassette, BCT-D6/D12/D22/D32/D40 Series | |
| Sampling frequency | Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz | Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz | | Y: 13.5 MHz, R-Y/B-Y: 6.75 MHz | |
| Quantization | 10 bits / sample | 10 bits / sample | | 10 bits / sample | |
| Error correction | Reed-Solomon code | Reed-Solomon code | | Reed-Solomon code | |
| Error concealment | Adaptive three dimensional | Adaptive three dimensional | | Adaptive three dimensional | |
| **Digital vidio performance** | | | | | |
| Band width | Y: 5.75 MHz +/-0.5 dB, R-Y/B-Y: 2.75 MHz +/-0.5 dB | Y: 5.75 MHz +/-0.5 dB, R-Y/B-Y: 2.75 MHz +/-0.5 dB | | Y: 5.75 MHz +/-0.5 dB, R-Y/B-Y: 2.75 MHz +/-0.5 dB | |
| S/N ratio | More than 62 dB | More than 62 dB | | More than 62 dB | |
| K-factor (2T pulse) | Less than 1 % | Less than 1 % | | Less than 1 % | |
| Linearity | Less than 2 % | Less than 2 % | | Less than 2 % | |
| Y/R-Y/B-Y delay | Less than 15 ns | Less than 15 ns | | Less than 15 ns | |
| **Digital audio performance** | | | | | |
| Sampling frequency | 48 kHz (synchronised with video) | 48 kHz (synchronised with video) | | 48 kHz (synchronised with video) | |
| Quantization | 20 bits / sample | 20 bits / sample | | 20 bits / sample | |
| A/D and D/A quantization | 16 bits / sample | 16 bits / sample | | 16 bits / sample | |
| Frequency response | 20 Hz to 20 kHz, +0.5 dB/-0.8 dB | 20 Hz to 20 kHz, +0.5 dB/-0.8 dB | | 20 Hz to 20 kHz, +0.5 dB/-0.8 dB | |
| Dynamic range | More than 85 dB (emphasis ON) | More than 85 dB (emphasis ON) | | More than 85 dB (emphasis ON) | |
| Distortion(at 1 kHz, emphasis ON, reference level) | Less than 0.08 % | Less than 0.08 % | | Less than 0.08 % | |
| Cross talk(at 1 kHz, reference level) | Less than –70 dB | Less than –70 dB | | Less than –70 dB | |
| Wow & flutter | Below measurable limit | Below measurable limit | | Below measurable limit | |
| Head room | 20 dB (ex-factory setting) | 20 dB (ex-factory setting) | | 20 dB (ex-factory setting) | |
| Emphasis(ON/OFF selectable) | T1 = 50 μs, T2 = 15 μs | T1 = 50 μs, T2 = 15 μs | | T1 = 50 μs, T2 = 15 μs | |
| **Analogue audio performance (Cue track)** | | | | | |
| Frequency response | 100 Hz to 12 kHz, +/-3 dB | 100 Hz to 12 kHz, +/-3 dB | | 100 Hz to 12 kHz, +/-3 dB | |
| S/N ratio | More than 50 dB, at 3 % distortion level | More than 50 dB, at 3 % distortion level | | More than 50 dB, at 3 % distortion level | |
| Distortion | Less than 1.5 % (T.H.D at 1 kHz, reference level) | Less than 1.5 % (T.H.D at 1 kHz, reference level) | | Less than 1.5 % (T.H.D at 1 kHz, reference level) | |
| Wow& flutter | Less than 0.2 % | Less than 0.2 % | | Less than 0.2 % | |
| **Camera section** | | | | | |
| **Camera** | | | | | |
| Pickup device | 3-chip 2/3-inch Power HAD IT CCD | 3-chip 2/3-inch 16:9/4:3 Widescreen Power HAD IT CCD | | 3-chip 2/3-inch 16:9/4:3 Widescreen Power HAD FIT CCD | |
| Picture elements | 795 (H) x 596 (V) | 1038 (H) x 594 (V) | | 1038 (H) x 594 (V) | |
| Optical system | F 1.4 prism system | F 1.4 prism system | | F 1.4 prism system | |
| Built-in filters | 1: Clear 2: 5600 K +1/8 ND 3: 5600K 4 5600 K+1/64 ND | 1: Clear 2: 1/4 ND 3: 1/16 ND 4: 1/64 ND A: Cross B: 3200 K C: 4300 K D: 6300 K | | | |
| Shutter speed | 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s) | 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s) | | 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (s) | |
| Lens mount | Special bayonet mount | Special bayonet mount | | Special bayonet mount | |
| Sensitivity(2000 lx, 89.9 % reflectance) | F10.0 (Typical) Equivalent to ISO 600 or more | F9.0 (Typical) Equivalent to ISO 500 or more | | | |
| Minimum illumination | Approx. 0.15 lx(F1.4 lens, +48 dB Turbo Gain) | Approx. 0.2 lx (F1.4 lens, +48 dB Turbo Gain) | | | |
| Smear level | -125 dB | -120 dB | | -140 dB | |
| S/N ratio | 63 dB (typical) | 63 dB (typical) | | 63 dB (typical) | |
| Vertical resolution | (Without EVS) 400 TV lines, (With EVS) 450 TV lines | | | (Without Super EVS) 400 TV lines, (With Super EVS) 450 TV lines | |
| Registration | 0.05 % (All zones, without lens) | 0.05 % (All zones, without lens) | | 0.05 % (All zones, without lens) | |
| Geometric distortion | Below measurable level (Without lens) | Below measurable level (Without lens) | | Below measurable level (Without lens) | |
| Warm-up time | 2 sec. | 2 sec. | | 2 sec. | |
| Modulation depth at 5 MHz | More than 55 % | More than 65 % | More than 55 % | More than 65 % | More than 55 % |
| **Viewfinder** | | | | | |
| CRT | 1.5-inch monochrome | 2.0-inch monochrome | | | |
| Controls | BRIGHT control, CONTRAST control, PEAKING control, TALLY, ZEBRA, DISPLAY switches | BRIGHT control, CONTRAST control, PEAKING control, TALLY, ZEBRA, DISPLAY switches | | BRIGHT control, CONTRAST control, PEAKING control, TALLY, ZEBRA, DISPLAY switches | |
| Horizontal resolution | 600 TV lines | 450 TV lines (16:9) | | | |
| Microphone | Ultra-directional (Detachable) | Ultra-directional (Detachable) | | Ultra-directional (Detachable) | |
| **Supplied Accessories** | Maintenance Manual (x1), Operation Manual (x1), Lens cap (x1), Shoulder belt (x1),Microphone (x1), XLR cap (x4) | Maintenance Manual (x1), Operation Manual (x1), Lens cap (x1), Shoulder belt (x1),Microphone (x1), XLR cap (x4) | | Maintenance Manual (x1), Operation Manual (x1), Lens cap (x1), Shoulder belt (x1),Microphone (x1), XLR cap (x4) | |

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